GEPPERT®
Band

FÖRDERSYSTEME - CONVEYING SYSTEMS - SYSTÈMES CONVOYEURS

Operating manual

for the models

Must be read before initial use !!!

Also applies to:
EM-R
EM-K
EM-Z-W
EM-S

GEPPERT-Band GmbH
Karl-Heinz-Beckurts-Str. 7
D-52428 Jülich

Phone: +49 2461 93767 0
Fax: +49 2461 93767 30

Email: info@geppert-band.de
Website: www.geppert-band.de

Table of contents:

1 Foreword 4
2 Safety when handling our belt conveyors 4
2.1 Safety equipment on our belt conveyors 4
2.2 General instructions on the proper operation of belt conveyors 4
2.3 Obligations of the company operating the belt conveyor 5
2.4 Safety symbols 5
3 Dimensions and Data 6
3.1 Belt conveyor frame 6
3.2 Plastic module chains 9
3.3 Motors 10
3.3.1 Geared motor type SN3F: 10
3.3.2 Geared motor type SN9F: 11
3.3.3 Geared motor type SN8F: 12
3.4 Electrical devices 13
3.4.1 Frequency converter 13
3.4.2 Protective motor switch 14
3.4.3 Emergency stop switch 15
4 Adjustments 16
4.1 Drive units 16
4.1.1 Lateral drive unit 16
4.2 Adjusting the Conveyor Chain 18
4.2.1 Adjust the length of the conveyor chain 18
4.2.2 Direction of movement of the conveyor chain 19
4.3 Support 20
4.3.1 Protection against tilting of flat belt conveyors 20
4.3.2 Two-legged aluminium support 21
4.3.3 Short two-legged aluminium support 22
4.3.4 Two-legged steel support 22
4.3.5 Short two-legged steel support 23
4.3.6 Short steel support with lateral retainer 23
4.3.7 Two-legged stainless steel support 23
4.3.8 Single-legged support made of steel with aluminium base plate 24
4.3.9 H single-legged support made of steel 24
4.3.10 H single-legged support made of steel, movable on castors 25
4.3.11 H single-legged support made of stainless steel 25
4.3.12 H single-legged support made of stainless steel, movable on castors 25
4.4 Flexible belt conveyors 26
5 Spare parts 27

List of illustrations:

Figure 3-1: EM-F frame dimensions 6
Figure 3-2: EM-C frame dimensions 6
Figure 3-3: EM-R-W frame dimensions 7
Figure 3-4: EM-K-W frame dimensions 7
Figure 3-5: EM-Z frame dimensions 8
Figure 3-6: Table of the plastic module chains 9
Figure 3-7: Frequency converter 13
Figure 3-8: Frequency converter connection to the motor 13
Figure 3-9: Protective motor switch 14
Figure 3-10: Protective motor switch connection to the motor 14
Figure 3-11: Emergency stop switch 15
Figure 3-12: Emergency stop switch connected to 230V 50Hz 15
Figure 3-13: Emergency stop switch connected to 380V 50Hz 15
Figure 4-1: Dismantling the engine at the side 16
Figure 4-2: Adjusting the play of the coupling 16
Figure 4-3: Rotation of the motor 17
Figure 4-4: Opening and closing the conveyor chain 18
Figure 4-5: Direction of movement of the conveyor chain 19
Figure 4-6: Maximum weight at the end of the belt with mobile supports 20
Figure 4-7: Two-legged support made of aluminium, height adjustment 21
Figure 4-8: Two-legged support made of aluminium, inclination adjustment 21
Figure 4-9: Two-legged steel support, height adjustment 22
Figure 4-10: Two-legged steel support, inclination adjustment 22
Figure 4-11: Short steel support with lateral retainer, height adjustment 23
Figure 4-12: Single-legged support made of steel with aluminium base plate, height adjustment 24
Figure 4-13: Single-legged support made of steel with aluminium base plate, inclination adjustment 24
Figure 4-14: H single-legged support made of steel, movable, brake 25
Figure 4-15: Possible angles of bend 26
Figure 4-16: Setting the angle of bend 26
Figure 4-17: Adjusting the angle of the upper bend 27

1 Foreword

Our belt conveyors are intended for in-plant use; they are not suitable for wet rooms or operating areas which are at risk of explosion. Special designs suitable for such areas, however, can be made available after consultation and confirmation.
As the only maintenance measure required for the belt conveyors we recommend to occasionally check the proper running of the belt. To adjust the running of the belt, we urgently advise you to comply with the instructions given in this operating manual.

2 Safety when handling our belt conveyors

All of our standard belt conveyors were designed with a particular focus on safety. Especially when working on the belt conveyors, unnecessary risks should be avoided. For this reason we have deliberately designed many components such that the risk of injury for the operating personnel operating our belt conveyors is minimised.

2.1 Safety equipment on our belt conveyors

One of the most frequent types of accident on belt conveyors is injuries to parts of the body which are drawn in between the circulating belt and the rotating rollers. In order to make it impossible for such accidents to occur or to reduce the risk as much as possible, all GEPPERT belt conveyors are fitted with a gap protection at all points where the belt runs onto a cylinder or roller. This gap protection is designed in such a way that during adjustment work it is automatically positioned in correct relation to the roller.

To prevent damage to electrical equipment and minimise the risk of an electric shock, all of the parts of our belt conveyors are earthed.

All belt conveyors are fitted with a safety switch as standard, which will automatically switch off the device if it is overloaded or overheated. In addition, all devices have an emergency stop switch to turn off the belt conveyor if there is imminent danger present. See also section 3.4.
If a belt conveyor is ordered without a safety switch or emergency stop switch, the operator must ensure the correct connection of the device and the possibility of bringing it to a standstill in the case of danger.

2.2 General instructions on the proper operation of belt conveyors

All mechanical installation work may only be performed by industrial mechanics (industrial fitters) or individuals who have received corresponding comparable training or instruction.
All work carried out on the electrical equipment may only be performed by trained electricians or individuals who have undergone comparable training.

The operators and anyone working on a belt conveyor must wear appropriate protective clothing. This includes in particular safety shoes for protecting against falling objects, as well as tight-fitting clothes and hairnets for individuals with long hair to minimise the risk of their hair being drawn into the device.

The correct functioning of the emergency stop equipment should be checked every day. This also includes a check of the protection against accidental restart after a drop in voltage. After a drop in voltage, the device must not be able to start up again of its own accord. It may only start after a switch has been activated.

If technically possible and provided for, the working height should be set to a level which is ergonomically meaningful.

Touching the belt while it is running, as well as the transport of individuals on the conveyor, is not permitted.

In an emergency, the belt conveyor can be moved backwards after being switched off by hand by pulling on the belt.

2.3 Obligations of the company operating the belt conveyor

The company operating a belt conveyor must ensure that the important preconditions for the safe functioning of the device are fulfilled. For this, the following must be complied with:

- The workplace of people working on the belt must be sufficiently illuminated.
- The devices may only be used within buildings.
- Compliance with the approved weights must be ensured. Here, attention must also be paid to the danger of belt conveyors on supports with castors tipping over.
- Any retrofitted parts must not result in the operator being placed at risk.

2.4 Safety symbols

Some of our standard belt conveyors may be furnished with special safety test symbols. Upon request, these will also be attached to the device.
However, a specific adaptation is often required due to the individual use of the belt conveyor. This can be carried out by us as the manufacturer or by the client himself. In both cases this may result in the safety test symbol no longer being valid.

3 Dimensions and Data

3.1 Belt conveyor frame

The most important dimensions of the EM-F / EM-C / EM-R-W / EM-K-W / EM-Z belt conveyors are shown in the following illustrations:

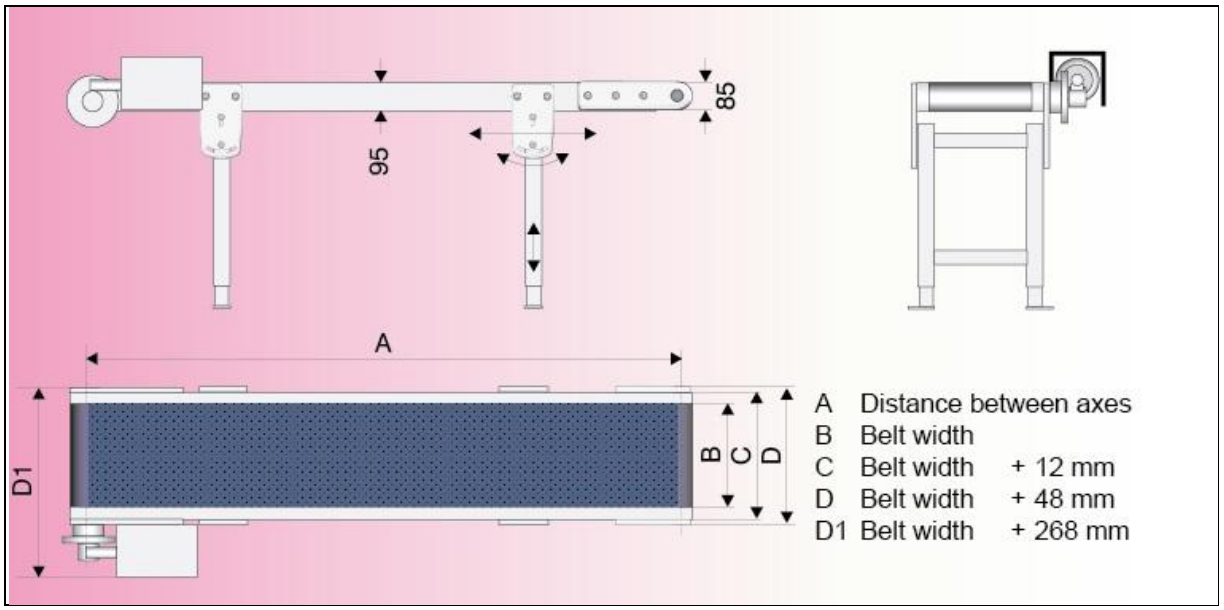


Figure 3-1: EM-F frame dimensions

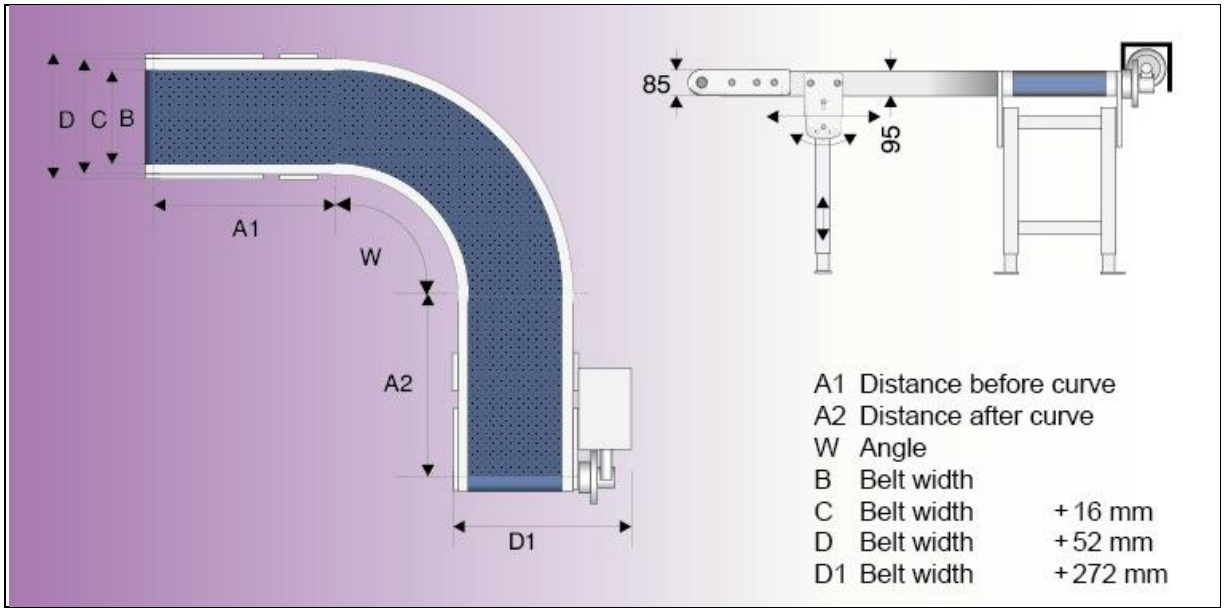


Figure 3-2: EM-C frame dimensions

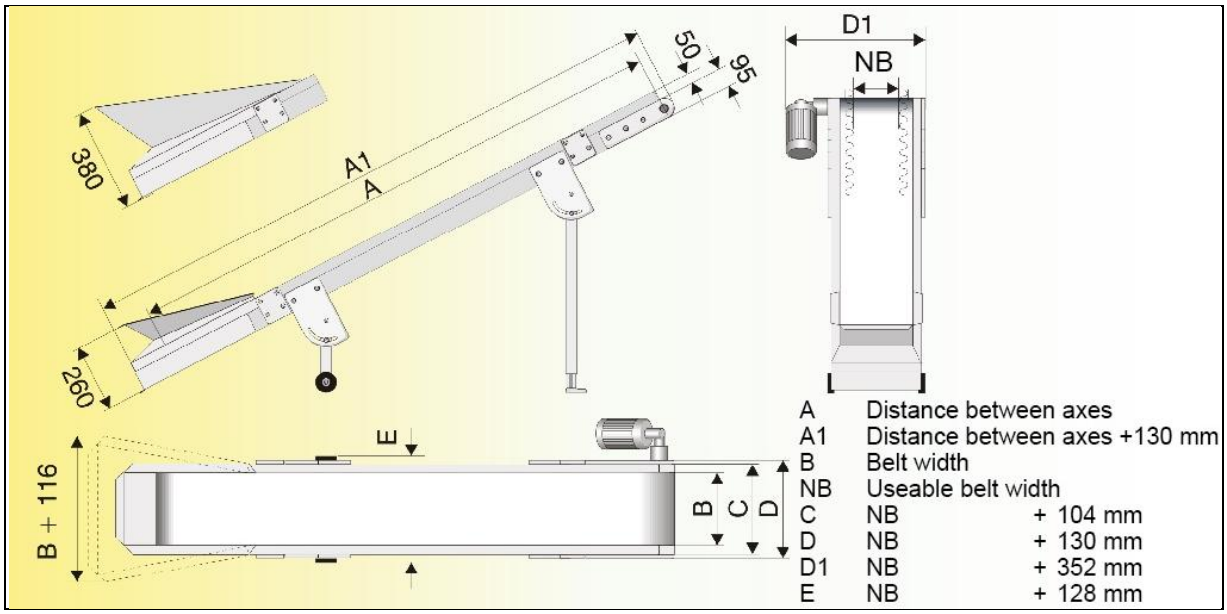


Figure 3-3: EM-R-W frame dimensions

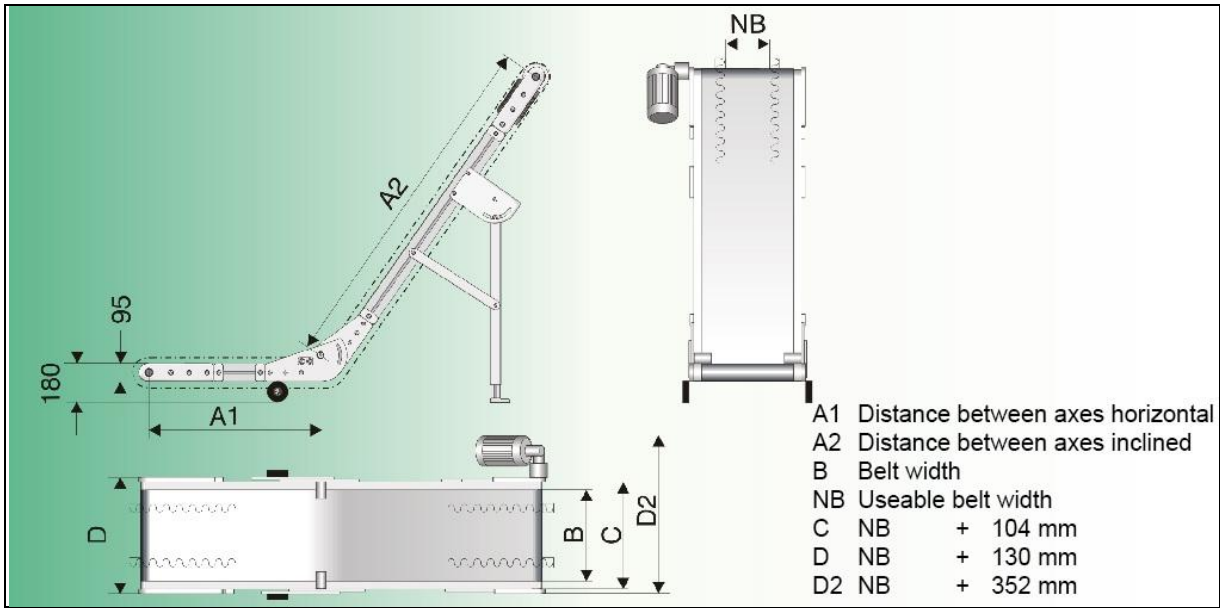


Figure 3-4: EM-K-W frame dimensions

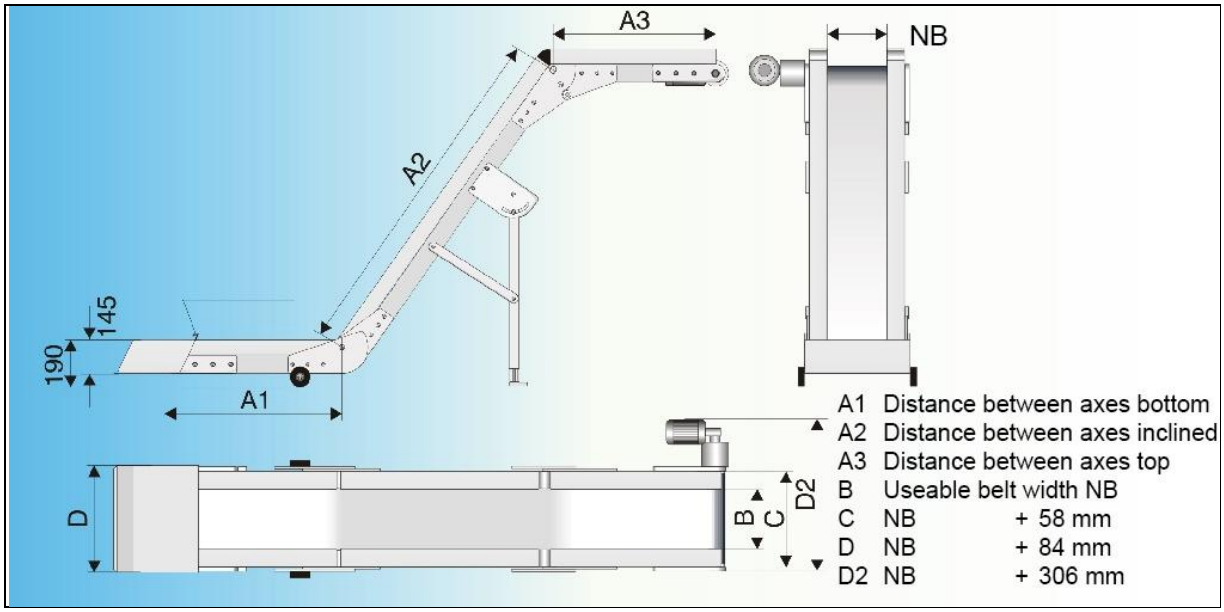


Figure 3-5: EM-Z frame dimensions

The frame dimensions of the EM-K, EM-R and the EM-S correspond to those of the EM-Z.

The frame dimensions of the EM-Z-W correspond to those of the EM-K-W.

3.2 Plastic module chains

The technical data of the plastic module chains which are used most frequently by us is shown in the following overview.

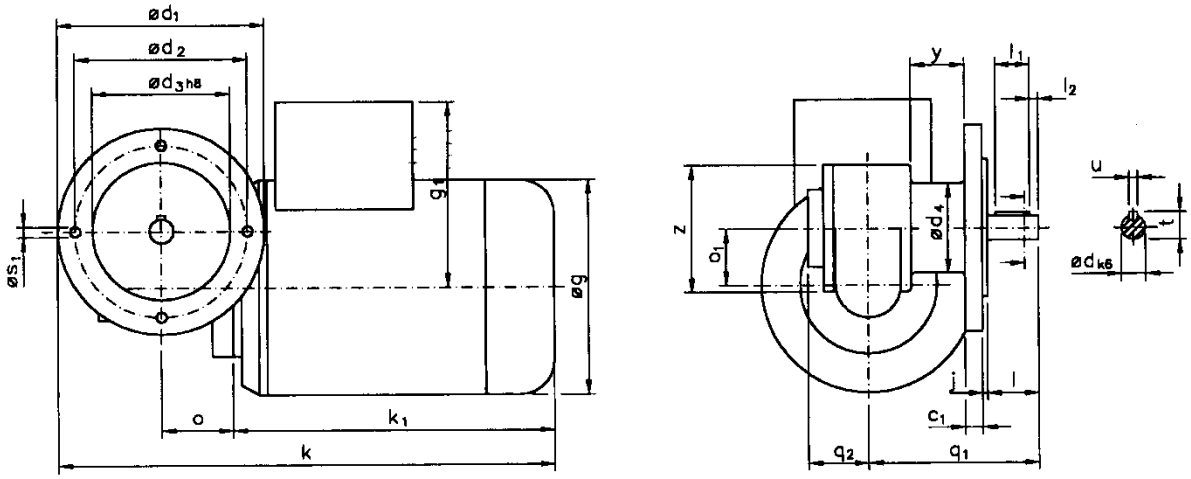
	Chain types		
	QNB	**ASB**	**S-MPB**
Belt widths	153 mm 305 mm 457 mm 610 mm	147 mm 301 mm 454 mm 607 mm	228 mm 304 mm 380 mm 456 mm 532 mm 608 mm
Bolts	PA6.6	PA6.6	PA6.6
Division	25.4 mm	25.4 mm	25.4 mm
Overall thickness	8,8 mm	12 mm	8,8 mm
Colour	blue	blue	white
Material supporting side	PP	POM-D	PP
Surface of the supporting side	smooth, closed	smooth, open 43%	smooth, closed
Antistatic	Non	Non	Non
Resistant to oil and grease	Yes	Yes	Yes
FDA approval	Yes	Yes	Yes
Temperature range	+1°C to +104°C	- 40°C to + 90°C	+1°C to +104°C

Figure 3-6: Table of the plastic module chains

3.3 Motors

Standard three-phase AC motors with worm gears with the protection rating IP 54 are used as standard in our belt conveyors. The dimensions and data of the various standard motors are listed below. Special motors are available on request.
The adjustment and maintenance of the drive chains or couplings are described in section 4.

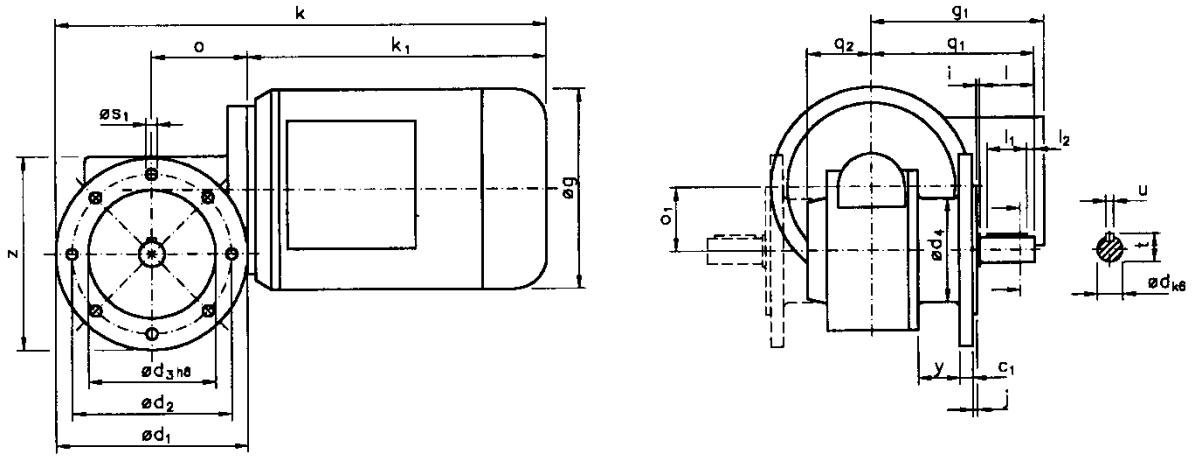
3.3.1 Geared motor type SN3F:



Mounting dimensions									Outline dimensions										Shaft dimensions						
c_1	$ød_1$	$ød_2$	$ød_3$	$ød_4$	j	$øs_1$			g	g_1	k	k_1	o	o_1	q	q_1	y	z	ød		l	l_1	l_2	t	u
10	120	100	80	52	3	M6			125	108	288,5	187	41,5	33	99	35	30	74	14		30,0	20	5	16,0	5

Gearbox data						
Motor data	180 Watt, 1400 rpm, weight 6,1Kg, 0,7Amps with 380V, IP54					
Gearbox ratio	7 : 1	10 : 1	15 : 1	20 : 1	30 : 1	56 : 1
Gearbox speed	200 rpm	140 rpm	93 rpm	70 rpm	47 rpm	25 rpm
Effective torque	6,7 Nm	10 Nm	12 Nm	12 Nm	14 Nm	17 Nm
max. permissible torque	12 Nm	12 Nm	13 Nm	13 Nm	13 Nm	10 Nm

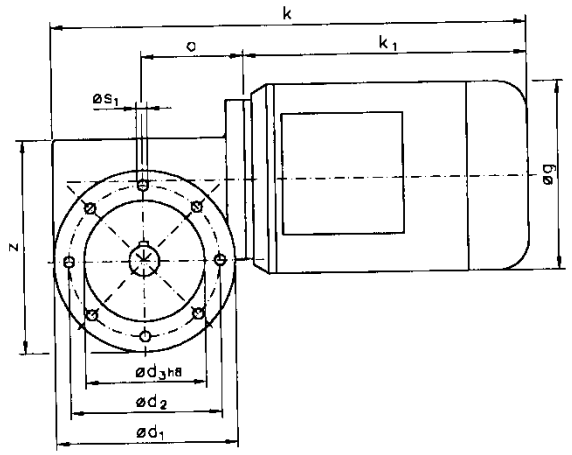
3.3.2 Geared motor type SN9F:

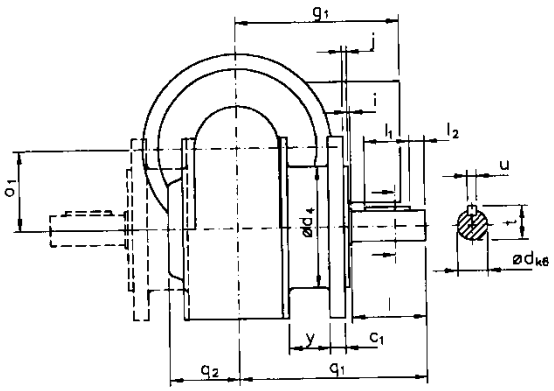


Mounting dimensions									Outline dimensions										Shaft dimensions						
c_1	$ød_1$	$ød_2$	$ød_3$	$ød_4$	j	$øs_1$			g	g_1	k	k_1	o	o_1	q	q_1	y	z	ød	i	l	l_1	l_2	t	u
8	120	100	80	65	3	7			140	114	327	207	60	40	102	40	25	121	16	1	35	25	5	18	5

Gearbox data						
Motor data	370 Watt, 1400 rpm, weight 9,2Kg, 1,2Amps with 380V, IP54					
Gearbox ratio	7 : 1	10 : 1	15 : 1	20 : 1	30 : 1	50 : 1
Gearbox speed	207 rpm	140 rpm	93 rpm	70 rpm	47 rpm	28 rpm
Effective torque	14 Nm	20 Nm	27 Nm	29 Nm	36 Nm	48 Nm
max. permissible torque	30 Nm	30 Nm	28 Nm	29 Nm	30 Nm	27 Nm

3.3.3 Geared motor type SN8F:





Mounting dimensions									Outline dimensions										Shaft dimensions						
c_1	$ød_1$	$ød_2$	$ød_3$	$ød_4$	j	$øs_1$			g	g_1	k	k_1	o	o_1	q	q_1	y	z	ød	i	l	l_1	l_2	t	u
10	120	100	80	80	3	7			140	114	334	207	67	53	124	46	25	141	20	1	50	30	10	22,5	6

Gearbox data						
Motor data	550 Watt, 1400 rpm, weight 10,7Kg, 1,6Amps with 380V, IP54					
Gearbox ratio	7 : 1	10 : 1	15 : 1	21 : 1	30 : 1	50 : 1
Gearbox speed	210 rpm	145 rpm	93 rpm	67 rpm	47 rpm	28 rpm
Effective torque	21 Nm	28 Nm	41 Nm	50 Nm	56 Nm	60 Nm
max. permissible torque	56 Nm	57 Nm	60 Nm	57 Nm	59 Nm	51 Nm

3.4 Electrical devices

All of our electrical devices may only come into contact with dust and liquids as specified by the protection rating applicable to them. Any contact of the electrical devices with liquids or dust that goes beyond this must be avoided.

3.4.1 Frequency converter

All of our belt conveyors which are to have adjustable belt speeds are equipped with a frequency converter as standard which controls a robust three-phase AC motor.

For all motors up to 250 watts performance the GB-FU 250 device is used. For motors from 250 to 370 watts the GB-FU 370 device is used. Motors which have more power than 370 watts are fitted with a frequency converter that is specifically adapted to them.

Figure 3-7: Frequency converter

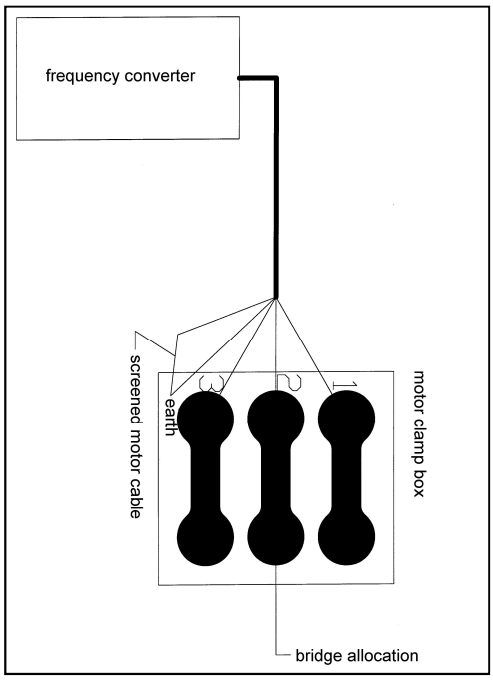


Figure 3-8: Frequency converter connection to the motor

All frequency converters are digital devices which can be individually programmed.
Each frequency converter also includes the function of protecting the motor against overload. Thus the destruction of the motor by a mechanically jammed belt conveyor is almost impossible. In this case the frequency converter turns the current off.
The frequency converters are connected to 230V 50Hz AC.
Separate operating instructions exist for these devices and are enclosed with every delivery.
Any change to the programming may only be carried out by trained personnel and after consultation with Geppert Band.

Furthermore, the frequency converter is equipped with an emergency stop switch in the form of a mushroom-type button to stop the belt conveyor quickly in the case of danger. After the voltage has dropped, the belt conveyor does not restart automatically, but a separate start button has to be operated.

3.4.2 Protective motor switch

All of our belt conveyors which are to have a constant belt speed are equipped with a protective motor switch, which controls a sturdy three-phase AC motor.

Figure 3-9: Protective motor switch

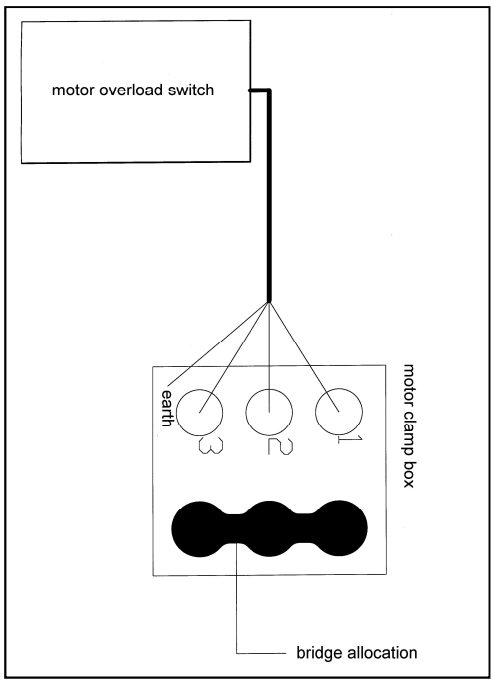


Figure 3-10: Protective motor switch connection to the motor

The protective motor switch has the function of protecting the motor against overload. Thus the destruction of the motor by a mechanically jammed belt conveyor is almost impossible. In this case the protective motor switch turns the current off. Furthermore, the protective motor switch is equipped with an emergency stop switch in the form of a snap-switch, which makes it possible to bring the belt conveyor to a standstill quickly.
The protective motor switch is connected to 380V 50Hz three-phase current.

3.4.3 Emergency stop switch

In addition, all belt conveyors can be fitted with one or more emergency stop switches in the form of a mushroom-type button.
The emergency stop switch is positioned between the source of the current and the belt conveyor in series, so that individually operating any switch will immediately bring the entire belt conveyor to a standstill.

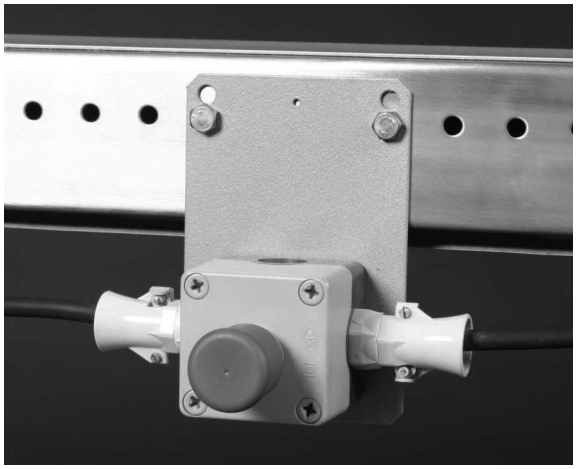


Figure 3-11: Emergency stop switch

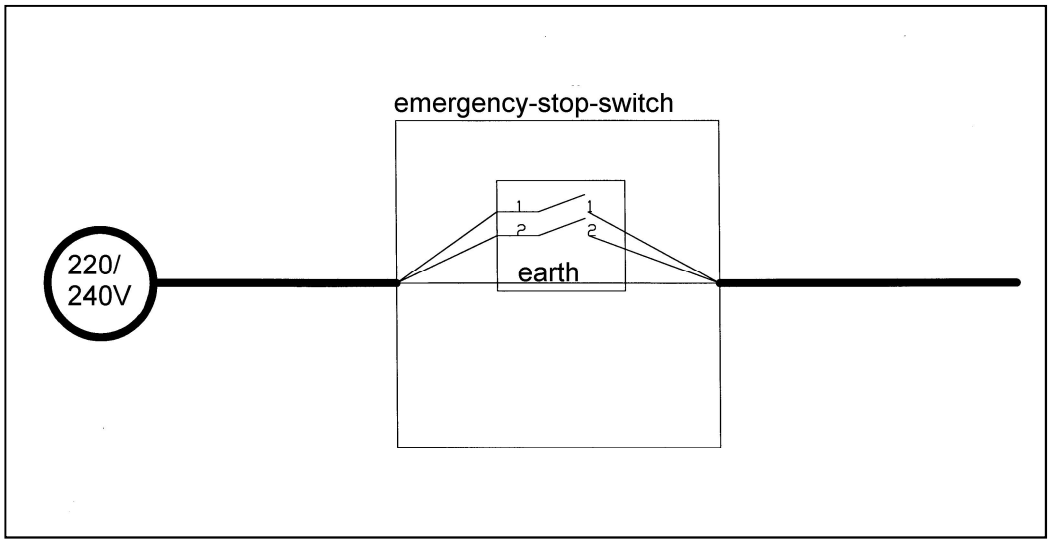


Figure 3-12: Emergency stop switch connected to 230V 50Hz

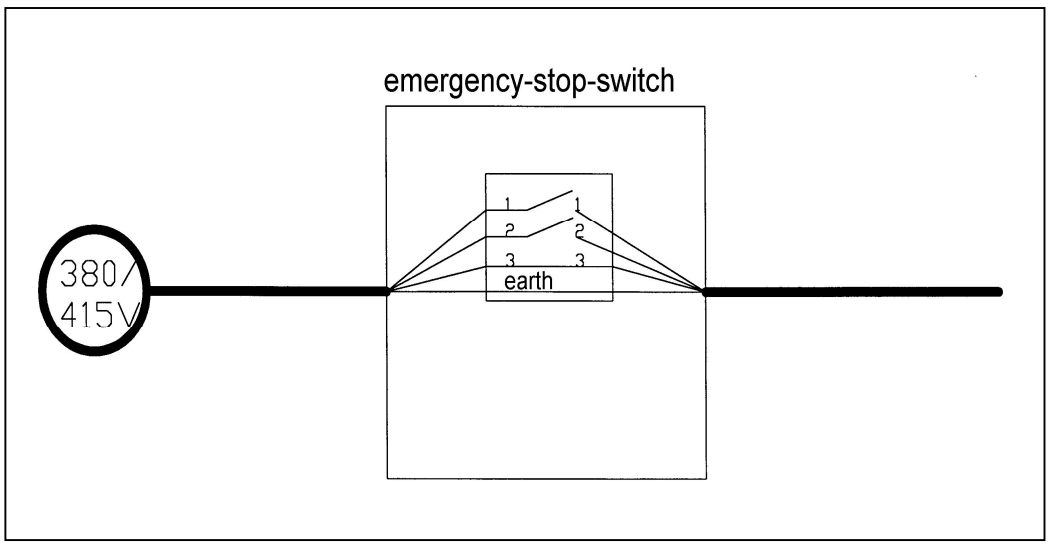


Figure 3-13: Emergency stop switch connected to 380V 50Hz

4 Adjustments

During all adjustment work it must be ensured that all of the covers and brackets that have been removed to carry out such work are correctly reattached after the adjustments have been carried out and before the belt is put back into operation.

4.1 Drive units

4.1.1 Lateral drive unit

If the motor is attached on the side next to the belt conveyor, it must be ensured that the coupling is correctly adjusted.

In order to adjust the coupling, it is first necessary, as shown in the adjacent illustration, to remove the motor (A) by loosening the retaining nuts (B).

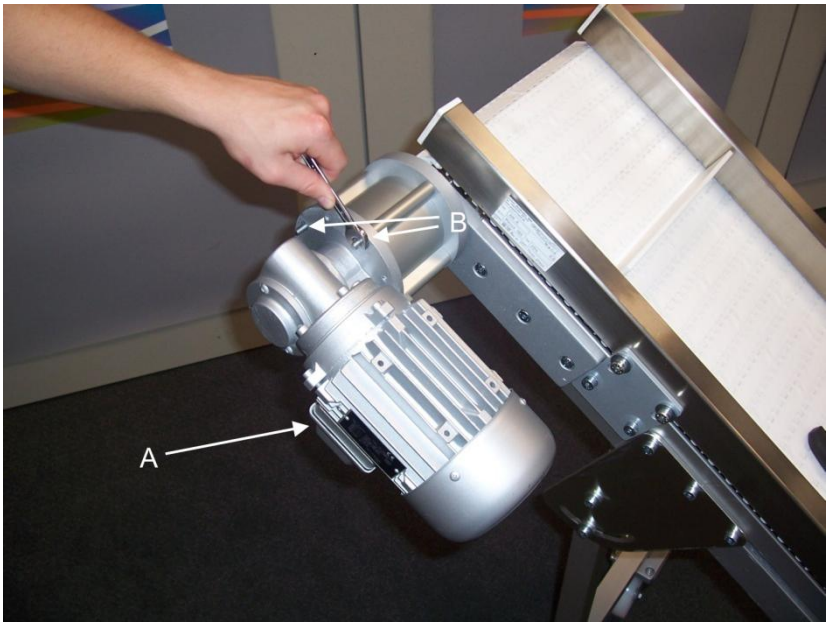


Figure 4-1: Dismantling the engine at the side

Then, as shown in the adjacent illustration, the distance between the coupling wheels (C) of the motor (A) and the drive roller (D) shall be approximately 15mm if the housing of the coupling (E) is held between the motor (A) and the flange (F). After the distance has been adjusted, the coupling sleeve (not shown) has to be placed over the wheel of the coupling (C) on the drive roller (D) and the motor reassembled. The retaining nuts (B) then have to be retightened.

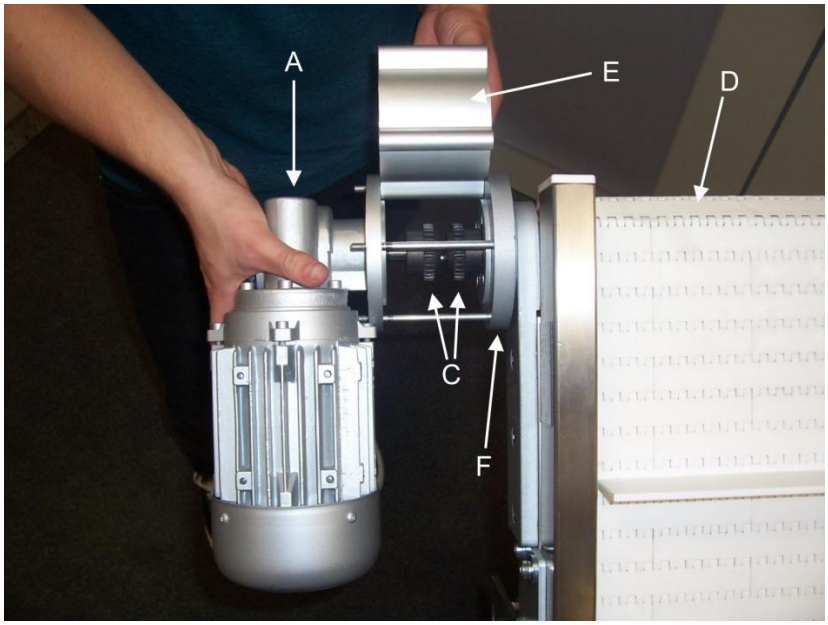


Figure 4-2: Adjusting the play of the coupling

When the motor is attached on the side next to the belt conveyor, the motor can, as shown in the adjacent illustration, be installed by turning in steps of 90° around the flange.

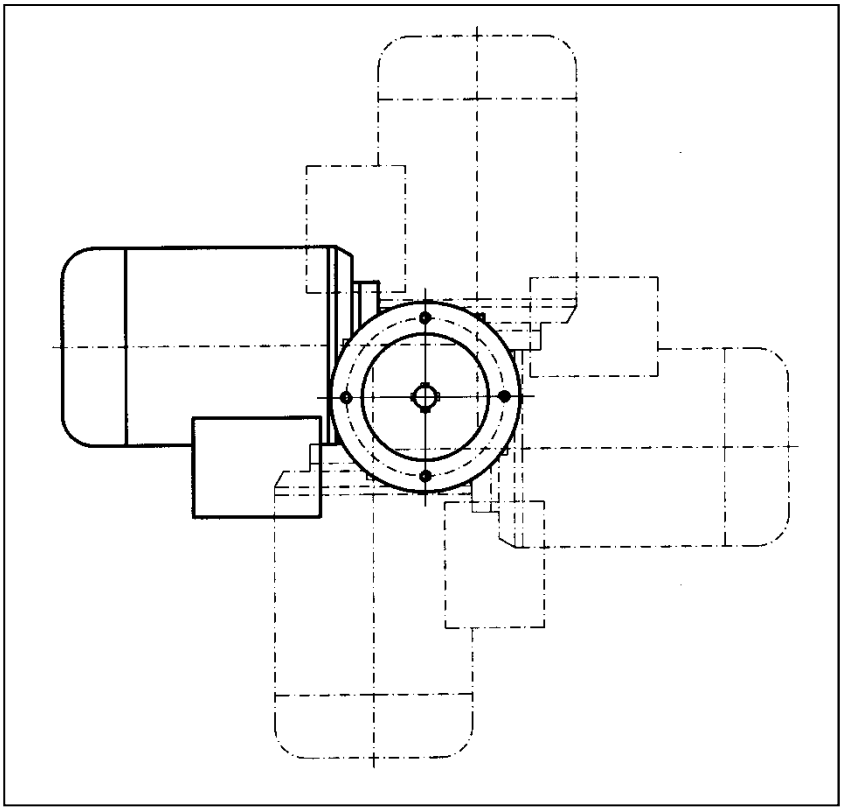


Figure 4-3: Rotation of the motor

4.2 Adjusting the Conveyor Chain

4.2.1 Adjust the length of the conveyor chain

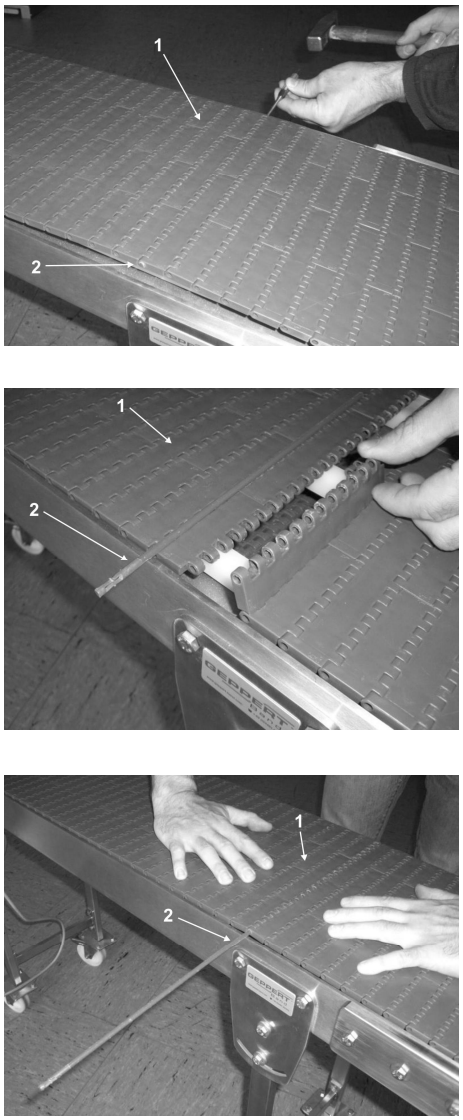


Figure 4-4: Opening and closing the conveyor chain

The conveyor chain has already been set at the factory to the required length. If necessary, a readjustment is carried out as follows:

1. Open the conveyor chain (1) at any point by knocking out a bolt (2).
2. Adjust the length of the chain by removing or inserting the required number of modules.
3. Close the conveyor chain (1) again by inserting the last bolt (2).

NOTE!

The slack of the chain below the drive roller must be at least 20mm. The following applies in general: the longer the conveyor chain, the greater the slack. A readjustment might become necessary due to temperature fluctuations.

4.2.2 Direction of movement of the conveyor chain

The conveyor chain has already been mounted at the factory onto the conveyor in the correct direction of travel. After disassembly, it should be remounted as shown in the illustration:

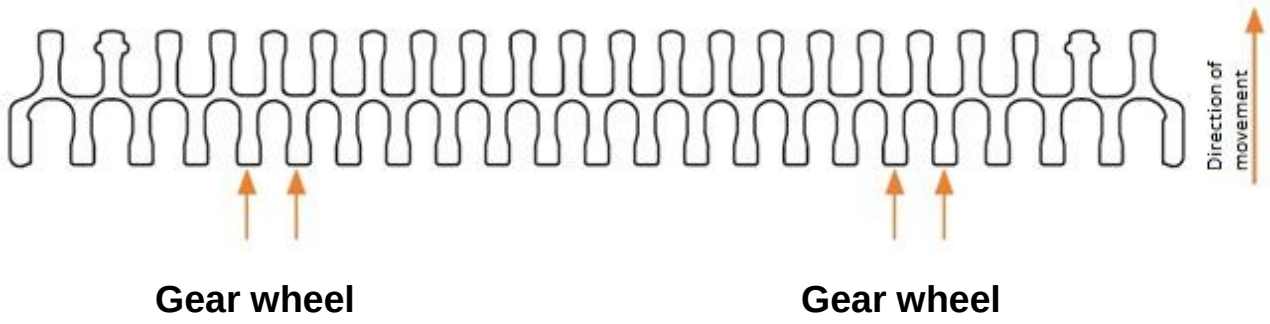


Figure 4-5: Direction of movement of the conveyor chain

4.3 Support

4.3.1 Protection against tilting of flat belt conveyors

Belt conveyors which are equipped with supports that are intended for bolting to the floor should indeed be secured with such a bolted connection.
Some of our supports are equipped with security casters with brakes. As a result, the belt conveyor can easily be used in different locations. However, these supports are less stable than supports without castors. For this reason, when the belts are moved to another location via a ramp or slope, the device must be secured by additional means as it may otherwise tilt over.
While the belt conveyor is being operated, it should be ensured that the supports are attached in each case as closely as possible to the end of the belt. For a distance of 400mm between the end of the belt and the middle of the support (projection a), the following diagram shows the maximum permitted weight on the end of the belt conveyor for a known length and width of the belt conveyor.

Maximum weight at the end of the belt for EM-F with movable supports

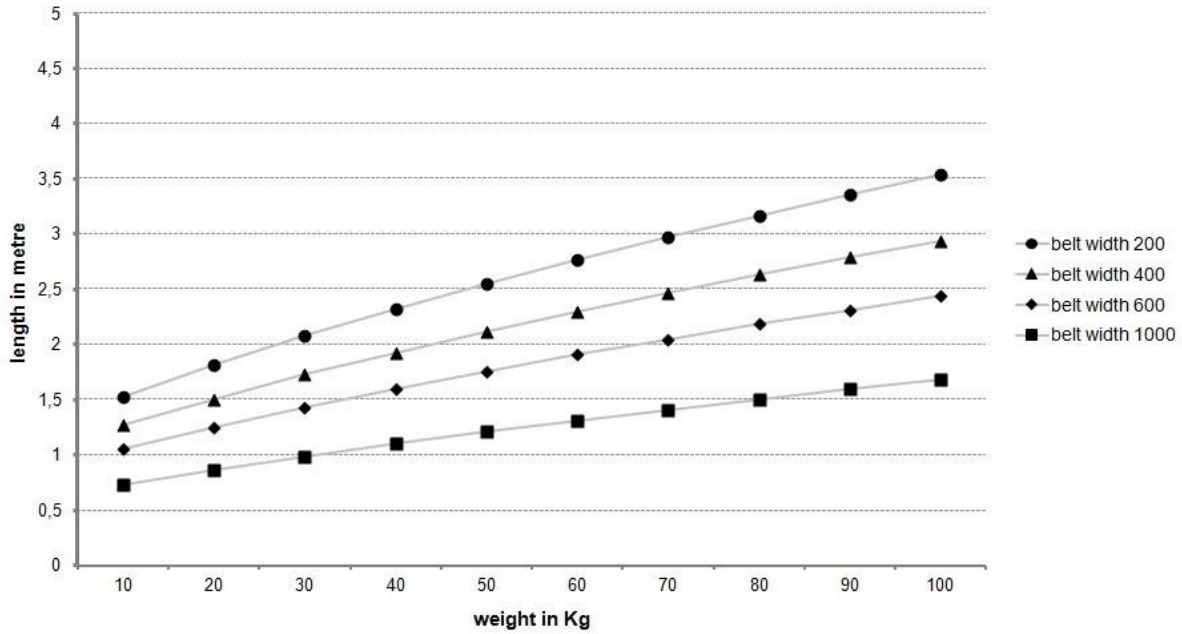


Figure 4-6: Maximum weight at the end of the belt with mobile supports

4.3.2 Two-legged aluminium support

The height of the two-legged aluminium support can be continuously adjusted. First of all, as shown in the adjacent illustration, the fixing screws (A) of the cross bar (B) have to be released. Then the support insert (C) can be pulled out of or pushed into the external tube of the support. An adjustment range of 200mm is provided as standard. After the adjustment, both fixing screws (A) must be firmly re-tightened.

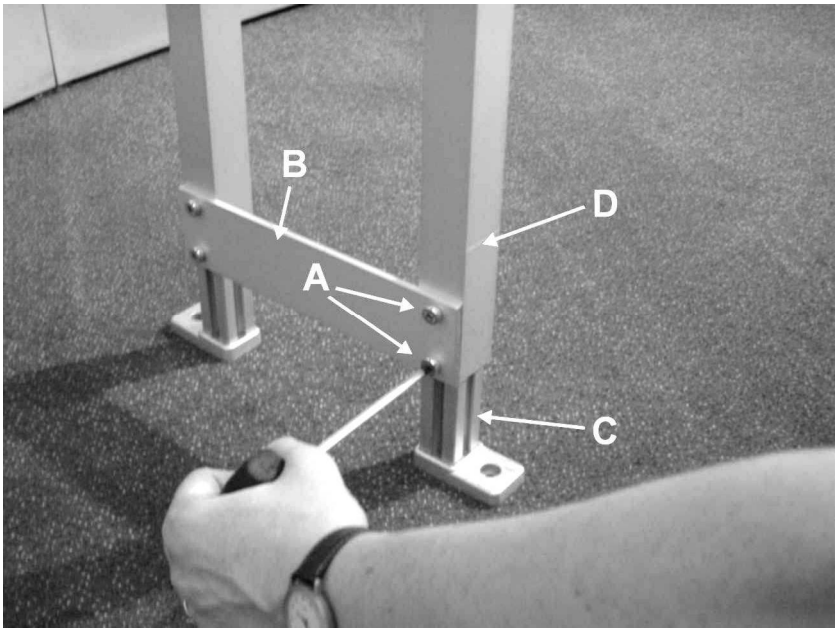


Figure 4-7: Two-legged support made of aluminium, height adjustment

The two-legged aluminium support can also be adjusted continuously in terms of its inclination. First of all, as shown in the adjacent illustration, the fixing screws (A) on the support plate (B) have to be released. Then the support can be swivelled in the guide mechanisms (C) of the support plate (B) from +30° to -30°. In the vertical position, the support locks into the positioning lock (D) and is therefore secured against accidentally folding inwards.
The two-legged aluminium support is also available in a version with support plates that have a swivel range from the horizontal position to the vertical position.

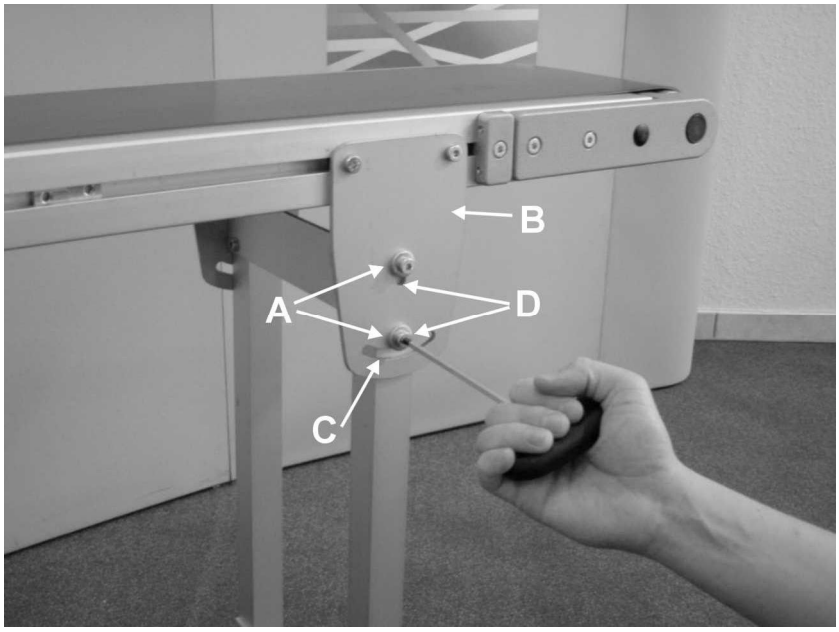


Figure 4-8: Two-legged support made of aluminium, inclination adjustment

4.3.3 Short two-legged aluminium support

In a shortened version, the two-legged aluminium support is equipped with fixed castors. Its height can also be adjusted as described under 4.3.2, although the adjustment range is only intended to compensate for uneven floors and is only 50mm. The inclination is adjusted as described under 4.3.2.

4.3.4 Two-legged steel support

The height of the two-legged steel support is continuously adjustable. First of all, as shown in the adjacent illustration, the fixing screws (A) of the crossbar (B) have to be released to a small amount. Then the support insert (C) can be pulled out of or pushed into the external tube of the support. An adjustment range of 200mm is provided as standard. After the adjustment, both fixing screws (A) must be firmly re-tightened.

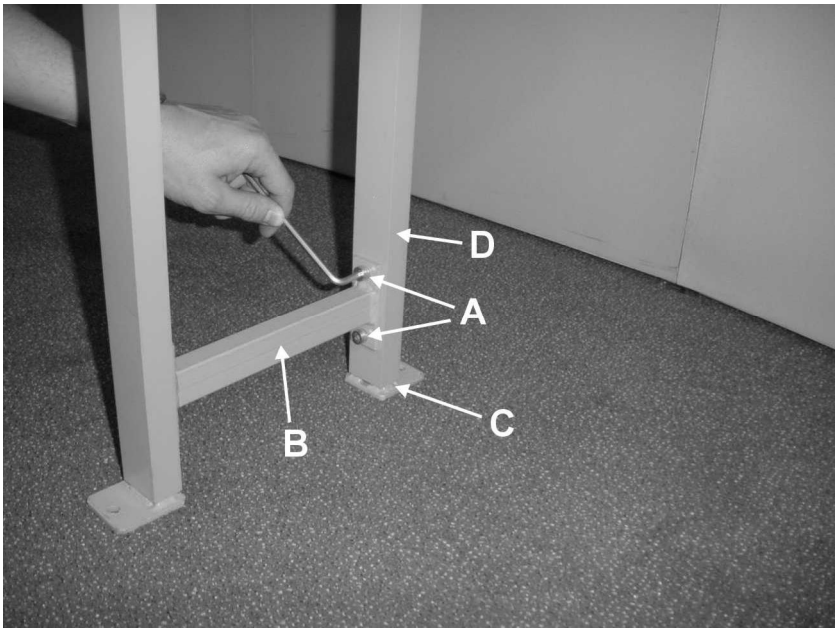


Figure 4-9: Two-legged steel support, height adjustment

The two-legged steel support can also be continuously adjusted with respect to its inclination. First of all, as shown in the adjacent illustration, the fixing screws (A) on the support plate (B) have to be released. Then the support can be swivelled in the guide mechanisms (C) of the support plate (B) from +30° to -30°. In the vertical position, the support locks into the positioning lock (D) and is therefore secured against accidentally folding inwards. The two-legged steel support is also available in a version with support plates which have a swivel range from the horizontal position to the vertical position.

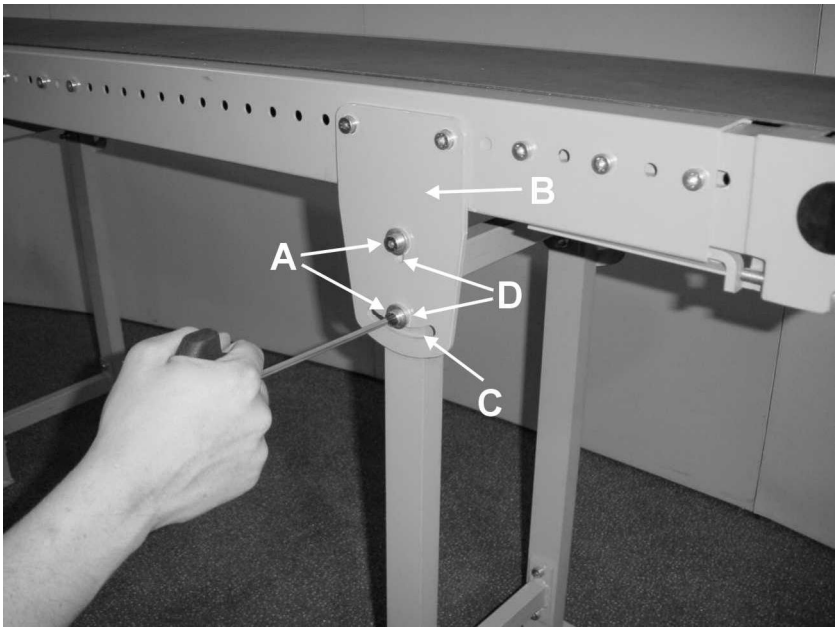


Figure 4-10: Two-legged steel support, inclination adjustment

4.3.5 Short two-legged steel support

The two-legged steel support is equipped in a shortened variation with fixed castors. The height can also be adjusted, as described under 4.3.4, although the adjustment range is intended only to compensate for uneven floors and is only 50mm. The adjustment of the inclination is carried out as described under 4.3.4.

4.3.6 Short steel support with lateral retainer

In order to adjust the height of the short steel support with lateral retainer, it is necessary first of all, as shown in the adjacent illustration, to release the fixing screws (A) on the lateral retainer (B). It is then possible to adjust the short support (C) in the lateral retainer (B). After the adjustment procedure, both fixing screws (A) must be firmly retightened.

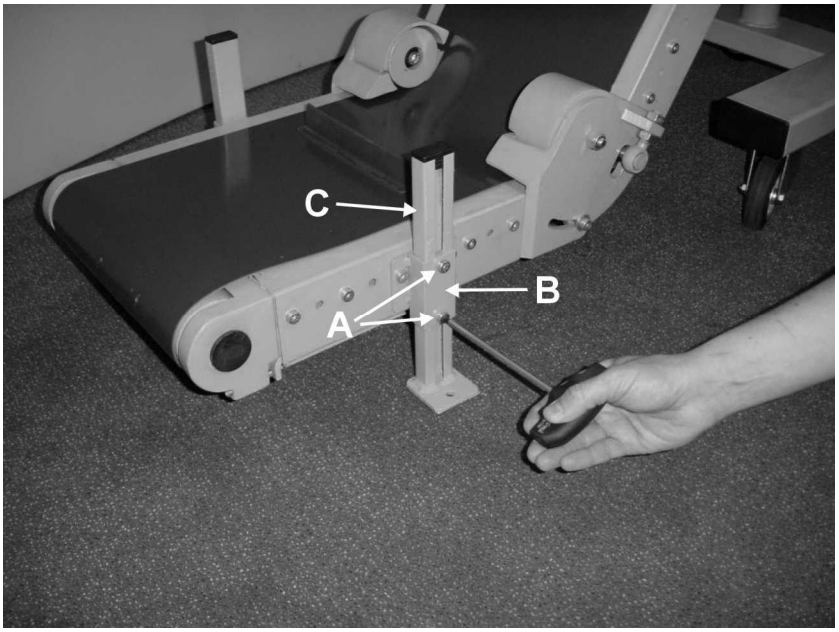


Figure 4-11: Short steel support with lateral retainer, height adjustment

4.3.7 Two-legged stainless steel support

The two-legged stainless steel support offers the same adjustment options as the two-legged steel support.

4.3.8 Single-legged support made of steel with aluminium base plate

The single-legged support made of steel with aluminium base plate can be continuously adjusted in terms of its height. As shown in the adjacent illustration, it is first necessary to release the fixing screw (A) on the adjusting collar (B). Here, the belt conveyor must be secured against unintentional lowering. Then the forked pipe (C) can be pulled out or pushed into the support base (D). An adjustment range of 200mm is provided as standard. After the adjustment process, the fixing screw (A) must be firmly retightened.

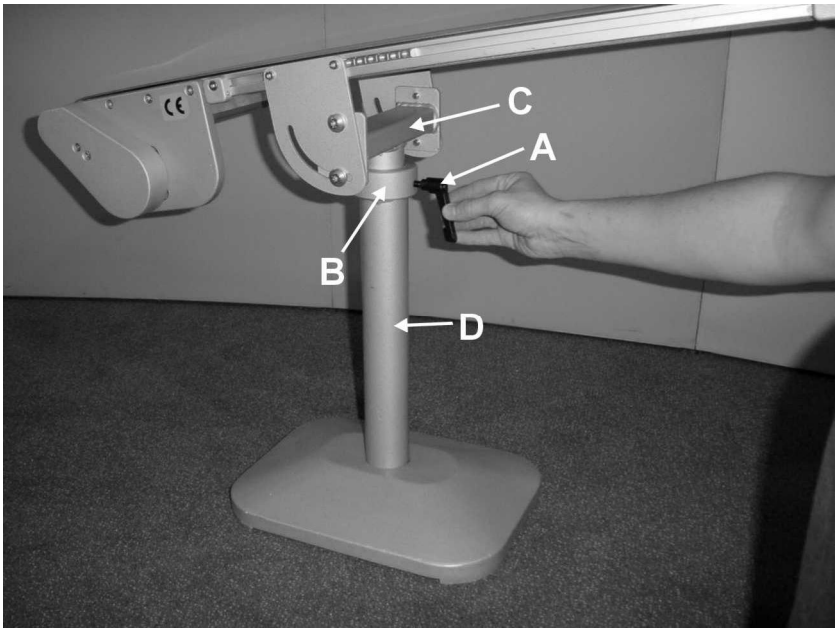


Figure 4-12: Single-legged support made of steel with aluminium base plate, height adjustment

The single-legged support made of steel with aluminium base plate can also be adjusted continuously in terms of its inclination. First of all, as shown in the adjacent illustration, the fixing screws (A) on the support plate (B) have to be released. Then the support can be swivelled in the guide mechanisms (C) of the support plate (B) from the horizontal to the vertical position.

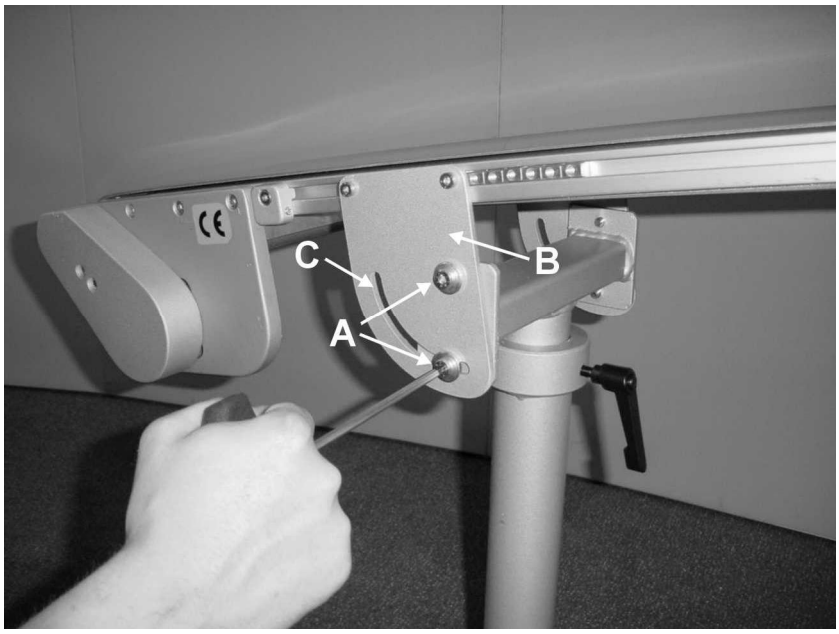


Figure 4-13: Single-legged support made of steel with aluminium base plate, inclination adjustment

4.3.9 H single-legged support made of steel

The H single-legged support made of steel has the same adjustment options as those of the single-legged support made of steel with an aluminium base plate.

4.3.10 H single-legged support made of steel, movable on castors

The H single-legged support made of steel, movable on castors, offers the same adjustment options as the H single-legged support made of steel.
In addition, it is equipped with Total Stop safety castors which, as shown in the adjacent illustration, can be secured against unintentional rolling by operating the brake.

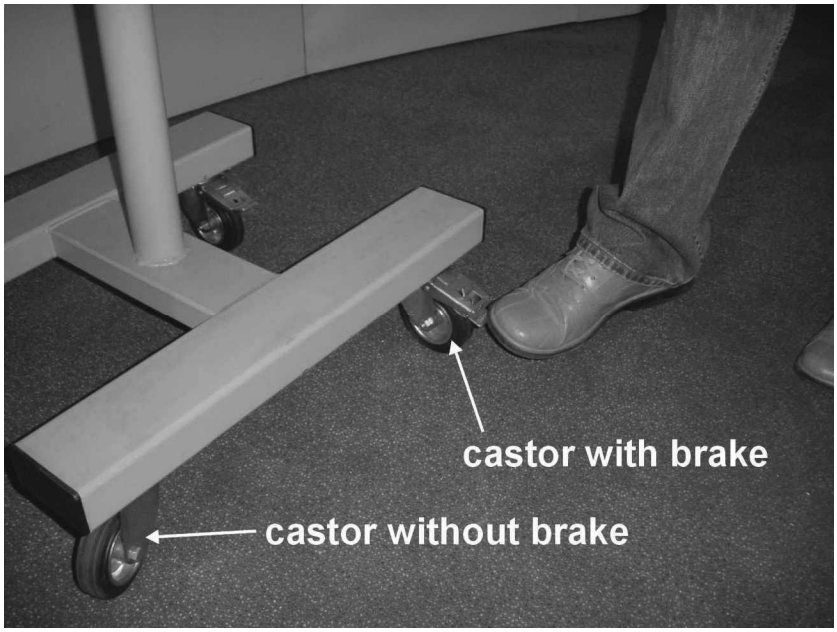


Figure 4-14: H single-legged support made of steel, movable, brake

4.3.11 H single-legged support made of stainless steel

The H single-legged support made of stainless steel offers the same adjustment options as the H single-legged support made of steel

4.3.12 H single-legged support made of stainless steel, movable on castors

The H single-legged support made of stainless steel, movable on castors, offers the same adjustment options as the H single-legged supports made of steel, movable on castors.

4.4 Flexible belt conveyors

In all of our flexible belt conveyors it is possible to adjust the angle of the bend between 20° and 70° in 5° steps, relative to the horizontal. The setting of angles shallower than 20° cannot be recommended, as this has negative effects on the movement of the chain. Before the angle is changed on any of our flexible belt conveyors, the chain has to be adjusted as described in section 4.2.
After every change the chain has to be readjusted as described in section 4.2.

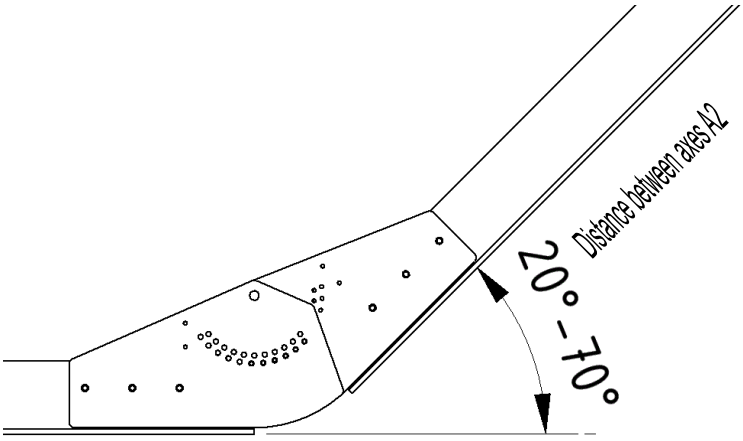
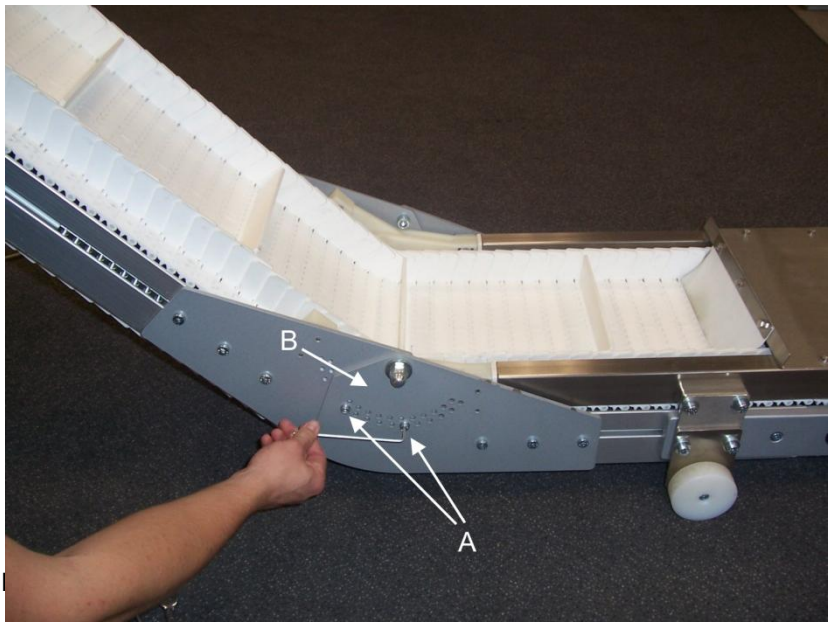


Figure 4-15: Possible angles of bend

In order to adjust the angle of the bend of the EM-K-W or the lower bend of the EM-Z it is necessary, as shown in the adjacent illustration, to release the fixing screws (A) on the side plate of the bend (B). Then the angle of bend can be changed. After the change of the bend, the fixing screw (A) must be firmly retightened.



In order to adjust the angle of the upper bend of the EM-Z, it is necessary, as shown in the adjacent illustration, to release the fixing screws (A) on the side plate of the bend section (B). Then the angle of bend can be changed. After the change of the bend, the fixing screw (A) must be firmly retightened.

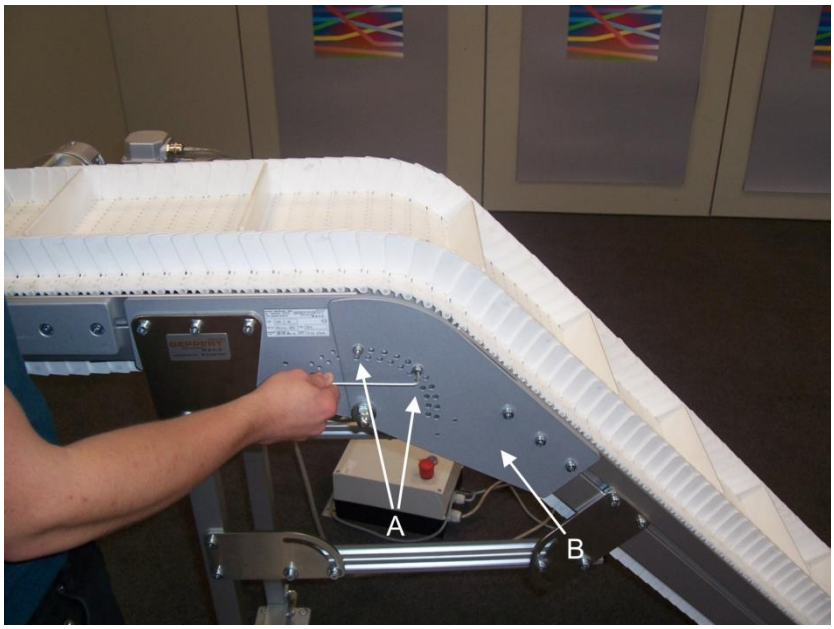
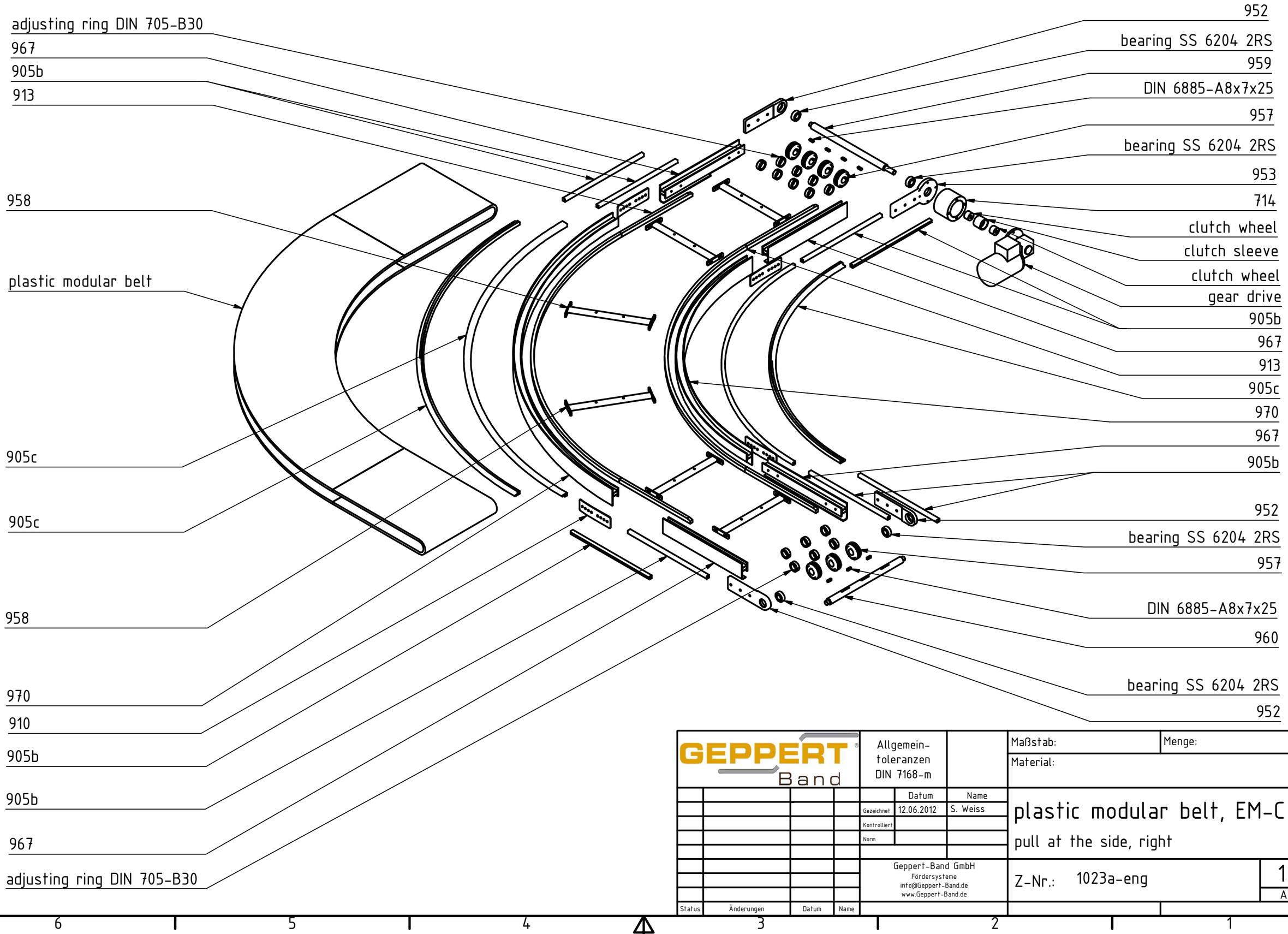


Figure 4-17: Adjusting the angle of the upper bend

5 Spare parts

All components of the belt conveyor types EM-F, EM-C, EM-R-W, EM-K-W and EM-Z are listed in the following exploded diagrams. If a part of your belt conveyor is not listed, it is a purpose-built special part We maintain a complete record of all special parts manufactured in our production documents. Please contact us directly if you need help with such a part.



GEPPERT Band

Allgemeintoleranzen DIN 7168-m

	Datum	Name
Gezeichnet	12.06.2012	S. Weiss
Kontrolliert		
Norm		

Maßstab:

Menge:

Material:

plastic modular belt, EM-C

pull at the side, right

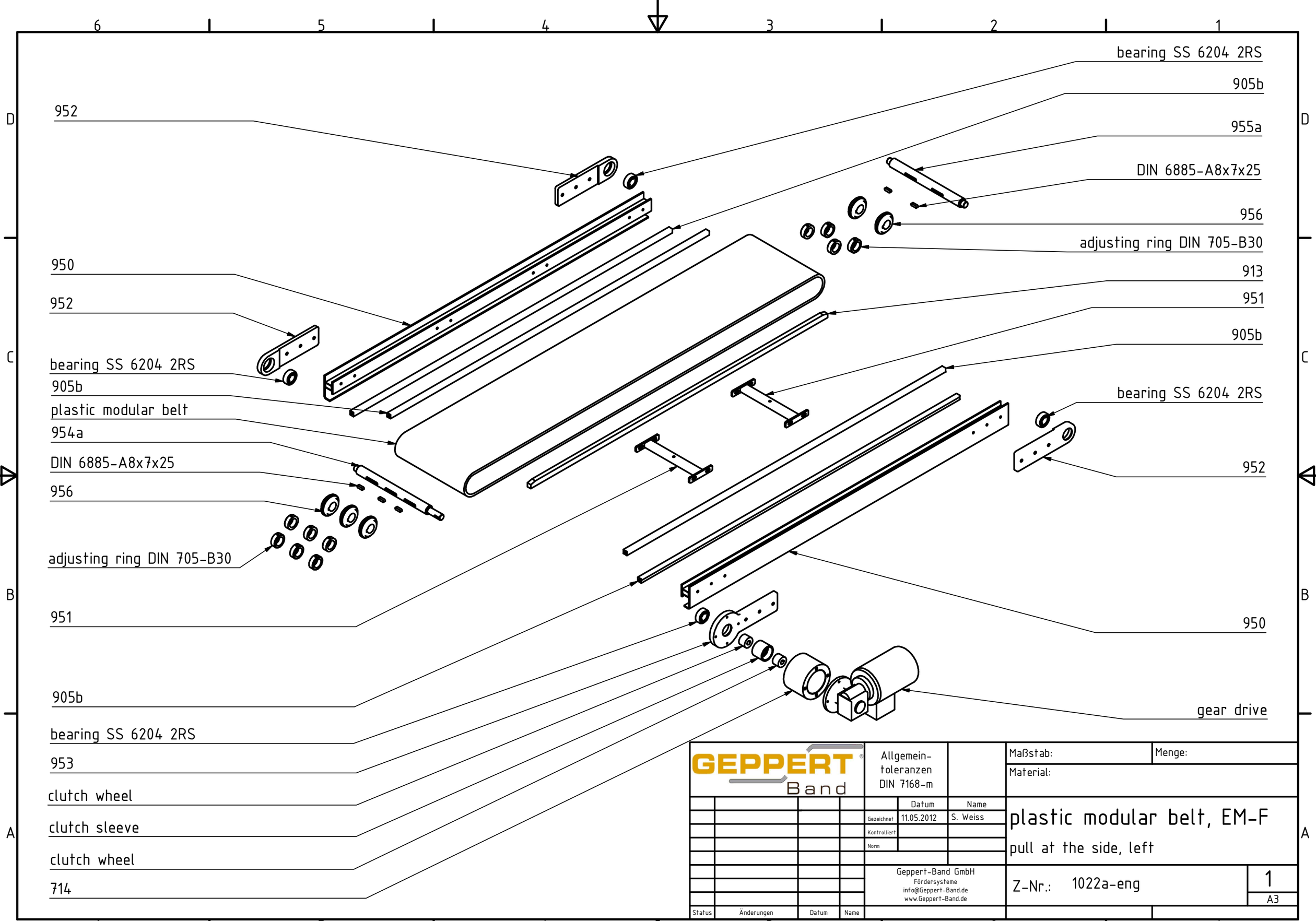
Z-Nr.: 1023a-eng

1

A3

Geppert-Band GmbH
Fördersysteme
info@Geppert-Band.de
www.Geppert-Band.de

Status	Änderungen	Datum	Name



GEPPERT Band

Allgemeintoleranzen DIN 7168-m

	Datum	Name
Gezeichnet	11.05.2012	S. Weiss
Kontrolliert		
Norm		

Maßstab:

Menge:

Material:

plastic modular belt, EM-F

pull at the side, left

Geppert-Band GmbH
Fördersysteme
info@Geppert-Band.de
www.Geppert-Band.de

Z-Nr.: 1022a-eng

1

A3

Status	Änderungen	Datum	Name